

Serial No. 09/529,365
Docket No.: 48700
CAM No.: 38738.817

REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the above amendment and the discussion below.

The claimed invention is addressed to an electrically activated valve having improved flow conditions in the region of the valve seat. These improved flow conditions are accomplished by having a contact area between the valve member 10 and the valve seat 13 bounded at the outside by a step 15 which is adjoined by guide surface 16 outside of the step or in other words radially positioned further from the valve stem. The step performs the function of limiting the effective hydraulic diameter of the valve member in order to ensure that it remains constant over its entire lifetime, as well as improving the flow so that the fluid is diverted to a return passage in an optimum manner thus avoiding cavitation and the noise associated with it.

Claims 8-9 and 15-16 have been rejected under 35 U.S.C. §102 as anticipated by the reference to Gordon et al. with the Office Action indicating that the contact area in Gordon et al. is the areas 17 and 18 and with the sharp outer edge of 17 being interpreted as a step and with the sloping surface adjoining the edge being inherently a guide surface.

Applicant respectfully traverses this rejection on the grounds that each of independent claims 8 and 15, as well as newly added independent claim 22

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define a structure which as a whole is not shown or disclosed or made obvious by the reference to Gordon et al.

The fuel injection nozzle of Gordon et al. has a needle valve 15 which is pulled against the valve seat 18 on the nozzle body 10 by closing spring 40 in the nozzle holder 12. The closing spring 40 keeps the needle valve 15 and particularly the valve cone 14 against the valve seat 18 on the body 10. When fuel is conveyed under pressure through supply conduits 27, pressure builds up on the piston valve 20 and the needle valve is displaced in the direction of flow so that the valve cone 17 lifts from the seat 18.

In contrast to the showing of Gordon et al., each of independent claims 8 and 15 recite an annular space between the valve guide and the valve member which is not clear from Gordon et al. and furthermore a contact area between a valve member and a valve seat has a step 15 adjoined by guide surface 16 wherein the guide surface is spaced radially further from the valve stem than the step 15.

Even if an edge of the frustoconical valve cone 17 of the ring 19 is indicated as having a "sharp edge" which corresponds to a "step", this step is positioned in Gordon et al. further away from the needle valve than the sloping surface of 17. It is also submitted that the "sharp edge" shown in Figure 3 does not confirm with Figure 2 or with Figure 4 which do not have a showing of a necessarily sharp edge and furthermore the slope of the edge in 17 is directly

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opposite the showing in Figure 2 and thus, the showing of a "sharp edge" is not indicative of the claimed step. In any event, the guiding surface is defined in claims 8 and 15 as being positioned further from valve stem than the step.

Newly added claim 22 also defines over the reference to Gordon et al. as it relates that the valve member has a portion which exceeds the radius of the hole in the valve housing and is adjoined by guide surface which exceeds the radius of the step. Gordon et al. has no such structure. If the closing head 16 of Gordon et al. is interpreted as the portion which exceeds the radius of the pressure chamber 21 then it is not associated with either a step or a guiding surface. On the other hand, the valve cone 17 is a part of the ring 19 which is placed on the end of the closing head 16. Once again, there is no showing of the required radial spacing distances between any kind of a surface that can be interpreted as a guide surface and a "step".

Therefore, in view of the distinguishing features between the claimed invention and the references which features are not shown or disclosed or made obvious by the reference, Applicant respectfully requests that this application containing claims 8-22, including independent claims 8, 15 and 22 be allowed and be passed to issue.

If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

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If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket No. 225/48700).

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please amend claims 8 and 15 as follows:

8. (Amended) An electrically activated valve comprising:
a valve stem holding a valve member interacting with a valve seat on a valve housing;
a valve spring providing a force in a first direction on said valve;
a valve guide for guiding said valve stem in said valve housing;
an activating device which, when activated, provides a force in a direction opposite said first direction to axially move said valve stem and said valve member in said valve housing and said valve member interacting with [a] said valve seat on said valve housing to thereby determine flow through said valve;
an annular space formed between said valve guide and said valve member, said annular space providing a contact area between the valve member and the valve seat which is bounded on one side by a step adjoined by a guide surface wherein a distance between said valve stem and said guide surface is greater than a distance from said valve stem and said step.

15. (Amended) A valve system, comprising:
a valve member having a valve stem;
a valve housing containing said valve stem and a valve seat;
a valve spring providing a biasing force in a first direction against said valve stem;
an activation device which, when activated, provides a force in a second direction opposite to said first direction to axially move said valve stem;

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a valve guide for guiding said valve stem in said valve housing;
a contact area formed between the valve member and the valve seat, said contact area being bounded on one side by a step which is adjoined by a guide surface, said guide surface being located radially further from said valve stem than said step.